DOCUMENT RESUME

ED 285 469 HE 020 607

AUTHOR Bersted, Chris T.
TITLE Musk as a Pheromone? Didactic Exercise.
PUB DATE Apr 87
NOTE 14p.; Paper presented at the Annual Meeting of the Southwestern Psychological Association (New Orleans, LA, April 1987).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS College Students; *Experimental Psychology; Higher Education; *Hypothesis Testing; Laboratory Experiments; *Psychological Studies; Quasiexperimental Design; Research Design; *Research Methodology; *Research Skills; Student Projects

ABSTRACT

A classroom/laboratory exercise has been used to introduce college students to factorial research designs, differentiate between interpretations for experimental and quasi-experimental variables, and exemplify application of laboratory research methods to test practical questions (advertising claims). The exercise involves having randomly divided groups smell either a commercial cologne/perfume or the same product to which musk oil has been added, and then rating the sample on both attracting-repelling and masculine-feminine dimensions. The exercise is presently used in a laboratory section of a beginning course in psychological research methods, but could be adapted to a classroom. Hypotheses generated by students concern the possible pheromone-like qualities of musk oil, based both on known qualities of musk and on advertising claims. Discussion of possible results with students provides an opportunity for: (1) contrasting independent and quasi-independent variables, (2) introducing the concept of interactions and the way they may qualify or nullify main effects, and (3) suggesting the usefulness of multiple dependent variables. After the discussion, students write individual experimental reports of the research. (Author/SW)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED285469

Musk As A Pheromone? Didactic Exercise

Chris T. Bersted

Southwest Missouri State University

Paper presented at annual meeting

of the Southwestern Psychological Meeting

New Orleans, April, 1987

Running head: Musk

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Chris T. Bersted

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

HE 020 607

Abstract

This paper outlines a classroom or laboratory exercise designed to introduce students to the use of factorial designs to test intrinsically interesting hypotheses generated from advertising claims. The exercise involves having randomly divided groups smell either a commercial cologne/perfume or the same product to which musk oil has been added, and then rating the sample on both attracting-repelling and masculine-feminine dimensions. Gender of subject is a quasi-independent variable. Hypotheses generated by students concern the possible pheromone-like qualities of musk oil, based both on known qualities of musk and on advertising claims. Discussion of possible results provides an opportunity for contrasting independent and quasi-independent variables, for introducing the concept of interactions and how they may qualify or nullify main effects, and for suggesting the usefulness of multiple dependent variables. Results have been replicable, and provide for directed discussion of what future research might be conducted.

Students often hear in beginning behavioral science or education courses that "behavior is multiply determined", meaning that many genetic, biological, environmental, and historical variables may combine to lead to greater predictability of behavior. This paper describes the use of one classroom/laboratory exercise designed to explore this multiplicity which is useful for (a) introducing students to factorial research designs, (b) differentiating between interpretations for experimental and quasi-experimental variables, and (c) exemplifying application of laboratory research methods to test practical questions (advertising claims). This exercise is a modification of one suggested by Cantrell & Bennett (1979). At present this exercise is used in a laboratory section associated with a beginning course in psychological research methods, but could be used almost as well in a classroom situation.

Prior to this exercise, students have (a) taken a beginning course in statistics, (b) been exposed to the logic of hypothesis formulation and testing, (c) learned the format for writing papers according to the American Psychological Association Publication Manual (1983), and (d) conducted, written up, and been evaluated on a laboratory exercise using a two group randomized design. If instead this exercise were used in a classroom, only (b) would seem necessary.

Conduct of the Exercise

While a less formal procedure might be used in a classroom

situation, the exercise is conducted as follows. Students are randomly assigned to one of two rooms (groups). After assignment, they are told to individually go to one of two small separate rooms connected to the larger laboratory room, close the door, and sit at a small table in the room. They are told to open the small bottle and smell the contents and then to replace the cap on the bottle. They are told to respond by rating the smell of the contents on an arbitrary (usually 12) number of dimensions (9 point semantic differential scales such as good-bad, attracting-repelling, masculine-feminine, etc.) on a response sheet (see Cantrell & Bennett, 1979, for an example). Individuals are asked to mark the response sheet and to fold it over and return to the larger room, at which point the next student assigned to the room enters, and so on. After the last student assigned to each room is finished, the students are told to score their own response sheet on any scales I have decided to use as dependent variables. It is explained that the remaining scales are "filler" items to hide the intent of the research. Typically, only two dimensions are used, those of attracting-repelling and masculine-feminine. Since the scales are marked off as 9 point scales, they are scored with 9 as the most masculine and attracting points on the scales. The data are then reported verbally and recorded by the instructor. Since this course involves six to eight laboratory sections with twelve to fourteen students in each section, the data upon which students actually write their lab reports is combined across sections. (Alternatively, if one

had a relatively large number of students in a classroom situation, data could be recorded on the blackboard.)

Subsequent Discussion

Following collection of the data, students are told what was in the two bottles in the separate rooms. One bottle contained a commercially available cologne or perfume, and the other bottle contained the same cologne or perfume to which several drops of pure musk oil had been added. Thus, the independent variable is the presence or absence of musk oil. (The cologne or perfume selected seems to make little difference, and one could select one intended to be sold to males and one intended to be sold to females as a second independent variable.)

At this point, a discussion is initiated as to what a pheromone is. If no student is familiar with pheromones, it is pointed out that pheromones are chemical substances secreted by one gender of some species to often attract opposite gendered members of the same species and sometimes to repel members of the same gender of that species. In addition, (Cantrell & Bennett, 1979) it is discussed that musk oil is chemically similar to the human male sexual hormone, testosterone, and that one of the odors to which humans show greatest sensitivity (i.e., can detect in very small concentrations) is musk. It is also noted that some manufacturers/advertisers assert special properties to colognes/perfumes that state musk is an ingredient. For example, in literature accompanying Jovan Musk Oil (Jovan, 1972), words or phrases

such as "passion", "set pulses racing", and "its as if we bottled a basic animal instinct" are used.

It is also revealed at this time that the instructor, while recording students' evaluations on the two dependent variables in conjunction with whether an individual smelled the cologne or the cologne with musk added, was also recording the gender of the student (the quasi-independent variable). Students are then asked as a group to form hypotheses for the data that was just collected if musk were to have pheromone-like qualities for humans (backward from normal research techniques, but useful when one does not want subject bias to influence the results). Typically, students reason that since musk comes from a male animal, then if it acts as a pheromone-like substance in humans, then females should find a cologne with musk added as more attracting than the cologne by itself. Also, by the same reason, males, if anything, should find the cologne with musk added as more repelling (less attracting) than the cologne by itself. For the second dependent variable, masculine-feminine, students usually reason that both genders should find the cologne with musk added as more masculine smelling than the cologne by itself, again since musk comes from a male member of a species. Students are then (in a laboratory course) queried as to how they should evaluate the data. Depending upon their statistical expertise, multiple t-tests or a 2 X 2 ANOVA are agreed upon. (Alternatively, in a classroom rather than a laboratory situation, drawing graphs on the board would suffice for less

statistically sophisticated students.)

Prior to assignment of the laboratory report to be written by each student, several possible sets of results and resultant conclusions are discussed for the attracting-repelling dependent variable. This discussion emphasizes several important generalizations concerning research design. First, it is asked what a possible main effect of gender with no interaction might mean if found (i.e., females overall evaluated what they smelled as more attracting than males). Silence on the part of the students is the response hoped for since this main effect by itself is relatively uninterpretable (i.e., no cause-effect conclusions could be reached), because gender is a quasi-independent variable. It could be that females are more attracted to the particular cologne used than males, that females are more attracted to colognes in general than males, that females are more apt to use extreme ends (or middle portions) of semantic differential scales, that females are more willing to reveal being attracted to colognes, ad infinitum. Discussion revolves around the fact that quasi-independent variables are almost always confounded with differences between the groups other than the selected variable. Next, it is asked what a possible main effect of the presence or absence of musk added to the particular cologne might mean (e.g., the cologne plus musk evaluated as more attracting than the cologne by itself), again assuming no interaction. Since the presence or absence of cologne is an independent variable manipulated between equal (randomized) groups,

this effect would have a relatively clear interpretation. If the suggested results were found, it would appear that the addition of musk to at least the particular cologne used did lead (causal inference) to it being judged more attracting smelling. It is also useful, if a large number of subjects were used, to show that approximately equal proportions of male and female subjects were assigned to the two treatment groups.

Next, discussion is initiated concerning the predicted interaction between the independent variable (presence or absence of musk) and the quasi-independent variable (gender of subject) for the attracting-repelling dimension. A graph of this predicted interaction is constructed on the blackboard, and discussion is centered around the predicted differences in rated attractiveness for males and females. When first presented, the graph contains no main effect and only the predicted interaction. It is then shown how it would be possible to obtain the predicted interaction, but also a main effect of either gender of subject or presence or absence of musk (easily accomplished, for example, by moving the female profile line up or down when the independent variable is on the abscissa with gender of subject within the graph), or even both significant main effects. This discussion of possible results and interpretations points out the importance of factorial designs in determining how independent (or quasi-) variables may combine to increase predictabiity of behavior. In particular, it is shown and discussed how interactions may complement or qualify main

effects (e.g., both genders might find the cologne with musk more attracting than the cologne by itself, but only for females, or perhaps males might actually find the cologne with musk added as less attracting than the cologne by itself (as in a pheromone), but to a lesser extent than females find the cologne with musk added as more attracting). After the discussion outlined above, students are given the assignment to write individual experimental reports of the research (conforming again to the guidelines of the APA Publication Manual).

Typical Results

Figure 1 shows typical results found the last several semesters using either male or female colognes with the dependent variables of attracting-repelling and masculine-feminine. These results have been rather consistent, typically showing an interaction on both dependent variables, but sometimes a main effect of gender for one or both dependent variables (probably attributable to the cologne selected for use). First, as noted, the results for the attracting-repelling dimensions are relatively consistent with what students predict. Females typically evaluate the cologne with musk added as more attracting smelling than the cologne by itself. Males have never been found to significantly find either the cologne with musk added or the cologne by itself more attracting than the other. On the masculine-feminine dimension, however, females typically evaluate the cologne with musk added as more feminine smelling than the cologne by itself. Again, males do not seem to differentiate between the two samples.

These relatively dependable results are important since they demonstrate the utility for having more than one dependent variable. The first interaction is at least partly supportive of the conceptual hypothesis that musk has pheromone-like qualities in humans. On the other hand, the second interaction suggests that while musk may be attracting smelling to females, its addition to colognes seems to make them more feminine smelling. Most students when writing their papers see this apparent contradiction, and conclude that while musk may make colognes attracting smelling to females, the possibilitity of it acting like a pheromone is unlikely, both due to females finding colognes with musk added as more feminine than colognes by themselves, and also due to males not responding differentially to the two samples.

Unfortunately, the results do not lead to clear conclusions concerning advertising claims for products containing musk. For colognes designed to be sold to females, students frequently conclude that addition of musk to female colognes, as a practical matter, may help induce females to buy the product. In addition, some students argue that the addition of musk to cologne might also make the wearer present a better self image since she will feel "more attracting" and "more feminine", and thus might be more attractive to males, rather than the cologne having any direct effect upon males. Other students, however, argue that the purpose of a female cologne is to attract males, and the data are not consistent with that. Most students, however, argue against the conclusion of musk in male colognes,

primarily because a female would not want a male to smell feminine, and because males themselves do not seem responsive to it. The lack of agreed upon conclusions concerning advertising claims, however, is useful. After the writeups were turned in, the results are again discussed in class. This discussion is useful to show that rarely does a single piece of research completely answer the original question(s), but more often suggests further investigations to answer questions raised by the research.

The exercise described here is certainly not novel. On the other hand, it seems to be intrinsically interesting enough to students to be a useful vehicle for discussions of sometimes "dry" topics such as independent and quasi-independent variables, interactions, and multiple dependent variables.

References

Cantrell, D.P. & Bennett, T.L. (1979). Exploring the Sensory World: Laboratory Experiments in Sensation and Perception. Monterey, California: Brooks/Cole Publishing Company.

JOVAN Inc., 1972, Chicago, Illinois.

Publication Manual of the American Psychological Association. (1983). Washington, D.C.: American Psychological Association.

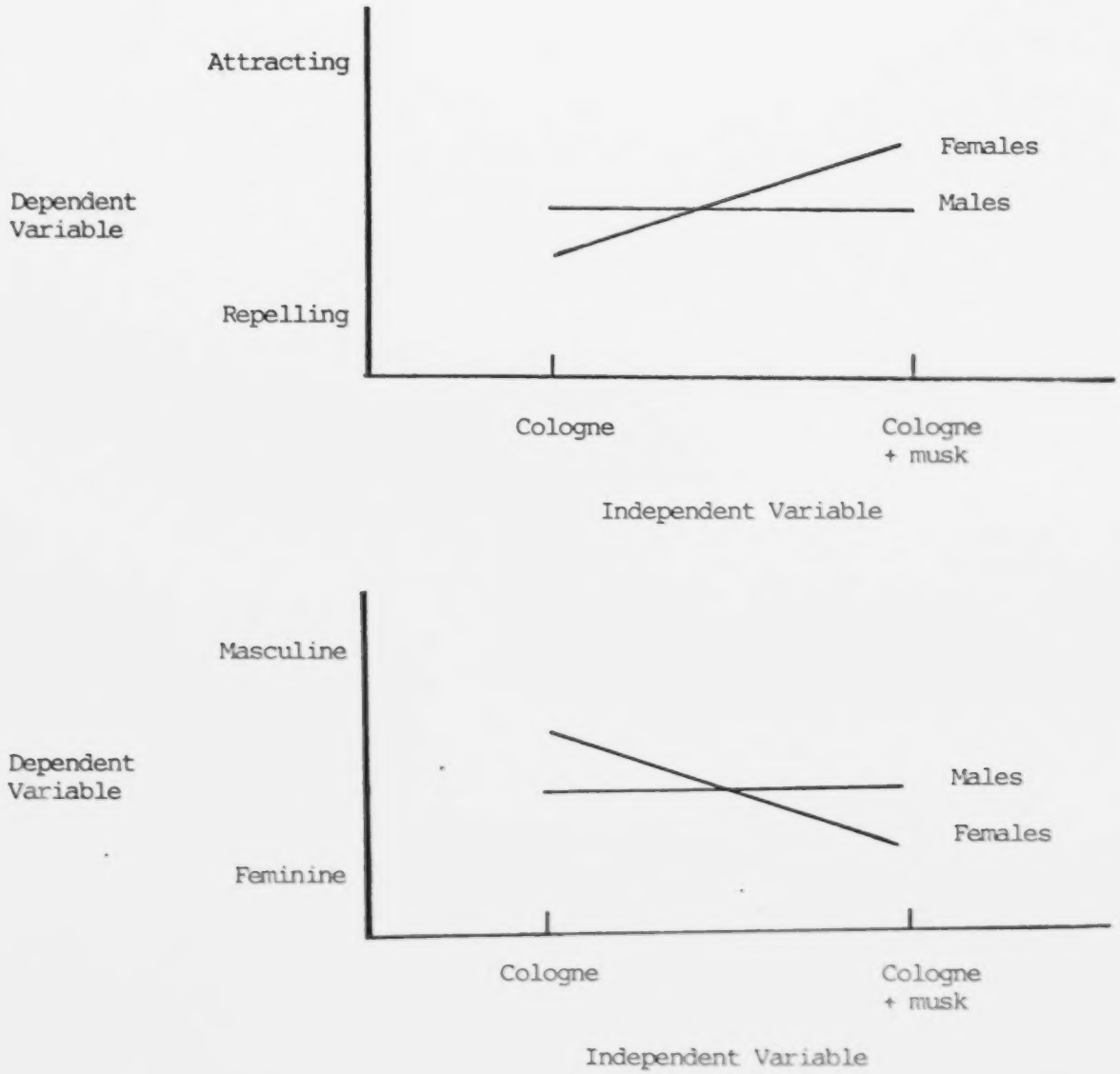

Figure 1: Typical Results for both Attracting-Repelling and Masculine-Feminine Dependent Variables.